

REMARKS

Applicants respectfully request reconsideration of the present application in view of the remarks below.

Claims 1-19 are pending.

Claims 1-12, 14, and 16-19 were rejected as being obvious over U.S. Patent Application Publication No. US 2002/0184580 to Archibald, Jr. et al. (hereinafter "Archibald, Jr.") in view of U.S. Patent No. 6,609,145 to Thompson et al. (hereinafter "Thompson"). With respect to independent claims 1, 18, and 19, the Examiner recognizes that Archibald, Jr. does not contemplate allocating processing time for predetermined time slots and relies on Thompson as teaching "allocating processing time [fig 10] by using a lookup table [fig 10] having rows and each row comprises a plurality of elements corresponding to the predetermined time slots [pause duration and pause interval in fig 10]." (Office Action dated March 23, 2005, page 3)

Applicants respectfully submit that Thompson neither describes nor suggests "allocating processing time... for predetermined time slots..." and thus, the combination of Thompson and Archibald, Jr. proposed by the Examiner does not yield the claimed arrangement. Thompson teaches assigning a user selectable priority (i.e., the REBUILD_PRIORITY in Figure 10) to disk array background operations. In particular, the REBUILD_PRIORITY is associated with a PAUSE_DURATION that indicates whether and for how long a processed command list 300 is delayed and a PAUSE_INTERVAL that "selects how many logical commands lists 300 will be processed before the foreground task is delayed." (Column 16, line 58 to column 17, line 39). "Each logical command list 300 might contain one or more host logical requests for one logical volume of drive array 120." (col. 4, lines 53-55). Figure 10 illustrates the different possible REBUILD_PRIORITY selections and their associated PAUSE_DURATION and PAUSE_INTERVAL values.

As is apparent from the above discussion of Thompson and consideration of Thompson Figure 10, the “time slot” during which a background operation is performed is not a *predetermined* time slot. Rather, the time slot to which Thompson allocates a rebuild operation is determined as a function of the PAUSE_DURATION and PAUSE_INTERVAL values associated with a user selected REBUILD_PRIORITY and the particular command list(s) after which the delays are introduced and during which a rebuild operation is performed. Even given the user selected REBUILD_PRIORITY and thus, the information regarding the associated PAUSE_DURATION and PAUSE_INTERVAL, the particular time slot during which the rebuild operation is performed will not be known. Rather what is known is that a particular delay, for example a delay of 1.6 seconds, will be introduced after every command list in the case of a REBUILD_PRIORITY of 254 for example. However, the time slot in which the rebuild operation will occur is still not “predetermined” as claimed, since the delay in Thompson is introduced and the rebuild operation is performed following execution of a command list and it is unknown how many “time slots” the command list may require for execution.

In contrast, the time slots to which Applicant’s I/O operations and background operations are allocated are predetermined, as a processor’s processing time is divided into time slots or slices 142 (see Figure 7 and page 12, line 9 to page 14, line 5 of the specification) and each such time slot is allocated to either an I/O operation or a background operation, based on an indicator of processor workload, as claimed. That is, I/O operations and background operations occur in *predetermined* time slots of allocated processing time. In view of the above, it is submitted that Thompson does not overcome the deficiency in Archibald, Jr.

Accordingly, it is submitted that independent claims 1, 18, and 19 are patentable over Archibald, Jr. whether taken separately or in combination with Thompson.

Claims 2-11, 14, and 16-17 depend from, and thus include the limitations of claim 1. Accordingly, it is submitted that claims 2-11, 14, and 16-17 are patentable at least for the reasons discussed above in conjunction with claim 1.

It is submitted that claim 5 is further patentably distinct over the cited references since neither Archibald, Jr. nor Thompson describes or suggests the method of claim 5, wherein allocating comprises using a lookup table. In this regard, the Examiner directs Applicant's attention to Figure 10 of Thompson. However, Figure 10 is a list of the different REBUILD_PRIORITY values (and the PAUSE_DURATION and PAUSE_INTERVAL associated with each such value) that a user can assign to a background operation. It is not a lookup table used in allocating processing time between I/O operations and background operations, as claimed.

It is submitted that dependent claim 6 is also further patentable over the cited references since the references neither describe nor suggest the method of claim 6 wherein the lookup table comprises rows corresponding to the busy levels and each row comprises a plurality of elements corresponding to the predetermined time slots. In this regard, the Examiner states that the Thompson shows a lookup table in Figure 10 "having rows and each row comprises a plurality of elements corresponding to the predetermined time slots [pause duration and pause interval in fig. 10]." Applicants respectfully disagree and point out that neither the Thompson PAUSE_DURATION nor the PAUSE_INTERVAL corresponds to a *predetermined* time slot. Rather, as described above, the PAUSE_DURATION indicates whether and for how long a processed command list 300 is *delayed* and a PAUSE_INTERVAL "selects *how many* logical commands lists 300 will be processed before the foreground task is delayed." (Column 16, line 58 to column 17, line 39, emphasis added).

The references also do not describe or suggest the method of claim 7, wherein the elements of the lookup table correspond to I/O operations and background operations and the lookup table is populated with the elements corresponding to I/O operations and background operations according to time percentages defining amounts of time allocated to tasks associated with such operations." Nor do the references describe or suggest the method of claim 9 wherein the determined busy level is used to index into the lookup table to select one of the I/O or background operations elements.

In view of the above, it is submitted that claims 1-12, 14, and 16-19 are patentable over the cited references.

Claims 13 and 15 are objected to as being dependent on a rejected base claim, but were indicated as being allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. In view of the above, it is submitted that claims 13 and 15 are allowable as depending on an allowable base claim.

As the claims and the entire case are believed to be in condition for allowance, an early indication thereof is respectfully requested.

The Examiner is respectfully invited to telephone the undersigning attorney if there are any questions regarding this Response or this application.

Applicants do not acquiesce to any assertions made by the Examiner that are not addressed herein.

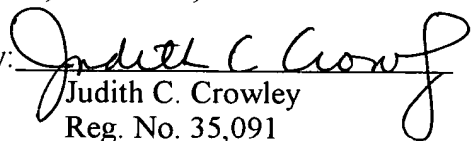
The Assistant Commissioner is hereby authorized to charge payment of any additional fees associated with this communication or credit any overpayment to Deposit Account No. 500845.

Respectfully submitted,

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